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ABSTRACT

This study attempted to answer two major questions: (1) Does a significant difference exist between the mean gain scores for achievement in reading and mathematics, as measured by the Comprehensive Test of Basic Skills (CTBS), among students from three different architectural school settings (open space, traditional, and mixed); and (2) Do reading and mathematics mean gain scores indicate a significant interaction between socioeconomic status (SES) and school setting? A total of 388 students who were in the third grade in 1977-78 and in the fifth grade in 1979-80 at the same schools participated in the study. In the third grade, students were administered Form S of the CTBS, and at the fifth grade they were administered the parallel Form T. Reading and mathematics scores in grade three were compared with those in grade five to obtain gain scores for each student. No significant differences were found between mean gain scores in mathematics or reading from the two SES groups or between mean gain scores in mathematics for students attending the three different types of school settings. The only significant F ratio was found for mean gain scores in reading for the students from the three settings--open, traditional and mixed. This difference, however, could not be solely attributed to any specific school setting. The findings were consistent with the available research on the subject. (Author/MP)

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Abstract

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Traditional and open space architecturally designed schools, as well as schools with a combination of both designs, operate in Berkeley County, West Virginia. The differences in long-term student achievement between traditional and open settings has been a concern in this school district as well as across the United States. A review of the literature offers inconclusive evidence to support increased academic achievement specifically attributed to open or traditional classroom setting. Therefore, prior studies have not indicated that serious negative effects on achievement could be solely attributed to open or traditional setting. This study was initiated to determine if there was a significant difference in mathematics or reading achievement of students in different architectural school settings. Three hundred eighty-eight students were tested using the Comprehensive Test of Basic Skills. Reading and mathematics scores in grade three were compared with those in grade five to obtain gain scores for each student. A two-way analysis of variance (ANOVA) was used to examine whether or not, at the $\alpha < 0.05$ significance level, there was a significant difference in the mean gain scores for students from two levels of socioeconomic status (SES) and from three school settings. ANOVA also checked for a significant interaction between SES and school setting. The results showed no significant difference between mean gain scores in mathematics or reading from the two SES groups or between mean gain scores in mathematics for students attending the three different types of school settings. The only significant F ratio was found for mean gain scores in reading for the students from the three settings--open, traditional and mixed. The only significant difference found could not be solely attributed to any specific school setting. That is, one setting was not more significantly related to mathematics and reading gains than any other setting. The findings were consistent with the available research on the subject.

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The Relationship of
Traditional, Open and Mixed
Architectural Settings
to
Reading and Mathematics Gain Scores
From Third to Fifth Grade
in
Berkeley County, West Virginia

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DEFINITION OF TERMS

1. Statistical Significance

The data in this study requires a comparison of mean scores or averages. The differences in the averages are caused by a number of factors. Through statistical procedures, called tests of significance, these differences can be tested to determine whether they are so great as to be related to the variables being examined and not just to error and chance.

2. F ratio, α 0.05 Level of Significance

If the statistical procedure discloses an F ratio which is significant at the α 0.05 level, the probability is equal to or less than α 0.05 that the results would be obtained by chance or error. In other words, an F ratio which is significant at the α 0.05 level indicates that the chances are 5 in 100 or less that the difference between the means would happen by chance.

3. One-Way Analysis of Variance (ANOVA)

The analysis of variance test of significance divides the variation in the data into different parts, each part assignable to a known source, cause, or error factor. If the variations cannot be attributed to error or chance, it is concluded that the results are, at least in part, a function of the variables being examined.

The ANOVA can be used to test the significance of the differences between means of different groups of students.

4. Two-Way Analysis of Variance

This test provides a method to investigate two independent variables simultaneously. In this study, one of these variables is SES level and the other is type of school setting. For the purpose of this study, the ANOVA results indicate whether there are significant differences in the mean gain scores of students from the different settings and from different SES levels. This test also shows whether the interaction of SES level and school setting is significantly related to reading and mathematics achievement. The test for interaction in the two-way ANOVA answers questions such as, "Do students from Level II socioeconomic status achieve significantly different in closed than in open or mixed classrooms?" An F ratio indicating no significant interaction means that the two variables do not interact to result in significantly different mean gain scores for the various combinations of groups examined.

5. Open Space Setting

An architecturally open structure designed to accommodate several teachers and their students in activities appropriate to the setting.

6. Open Classroom or Program

Instruction in an open classroom or program is characterized by flexibility and diversity in teaching methods and techniques. Open programs encourage team teaching, differentiated staffing, and individualization. The ability to adapt and modify both instructional levels and curriculum are usually encouraged.

7. Traditional Setting

A traditional classroom is usually enclosed by four walls with one teacher interacting with the same students from one class.

8. Traditional Classroom or Program

Traditional classrooms or programs utilize a structured delivery system. Traditional methods emphasize a formal learning environment.

9. Self-Contained Classroom

A single classroom accommodates one teacher and the same students for the entire day. All core subject areas are taught by the same teacher.

10. Mixed Setting

For the purpose of this study, a mixed setting is defined as a situation where students experience traditional settings in grades one and two, traditional or an open setting in grade three, and an open setting in grades four and five.

INTRODUCTION

Schools should be enjoyable, interesting places where rewarding learning experiences occur. It was with this goal that open education was received into the educational scene.

Open education is claimed to facilitate a warm, supportive environment that encourages a general feeling of acceptance and supports a positive self-concept. Likewise, the self-initiated and self-directed activities produce self-reliant, autonomous individuals, capable of making decisions and exercising responsibilities (Rogers, 1969; Rathbone, 1971). This environment is also a part of a traditional classroom; however, open classrooms are specifically established to encourage this learning climate.

The improvement of a child's attitude toward school is a major consideration when evaluating both academic and affective benefits. Enjoyment of the learning situation is a motivational factor that influences the behavior and academic achievement of elementary students.

The movement toward open space has been underway for over a decade. Over fifty percent of all new schools constructed from 1967 - 1970 were open space designs (George, 1975, 7). Berkeley County initiated construction of open facilities in 1970.

There is, therefore, a definite need for evidence to give direction to the evaluation and continuation of either open or traditional

education. The purpose of this study is to compare the reading and mathematics achievement of students from the three types of school settings in Berkeley County: (1) open space setting, (2) traditional setting, and (3) mixed setting, a combination of traditional and open space.

This study does not address instructional programs, methodologies, materials, or resources. The term "setting" refers specifically to the architectural aspect of elementary school buildings.

STATEMENT OF THE PROBLEM

This study attempted to answer two major questions: (1) Does a significant difference exist between the mean gain scores for achievement in reading and mathematics, as measured by the Comprehensive Test of Basic Skills, among students from open space, traditional, and mixed settings?" and (2) Do reading and mathematics mean gain scores indicate a significant interaction between socioeconomic level and school setting?"

REVIEW OF LITERATURE

The concept of openness in attitude and physical construction is universal among open space schools and implies active learning. However, active learning does not necessarily imply activity in a physical sense. There is no single term which can accurately describe the wide variety and degree of openness, physical arrangement and variability found in contemporary open architecture (George, 1975, 2).

There is a dichotomy between the content and process of education. The value of what is learned is assessed in terms of how it is learned. Traditional schools concentrate on what is learned while open schools emphasize the process of learning. When a school district emphasizes the process behind learning, it aids children in directing their learning and encourages them to solve their own problems. This presumes a flexible approach to the curriculum and to the learning space within the school.

Open programs may be conducted in traditional buildings or in large open areas. Such programs are usually characterized by individualization, small group instruction, team teaching, an environment rich in materials, freedom for children to move about, emphasis upon experimentation, an atmosphere of trust, creative abilities, and a minimum of grading.

The degree of openness in a school setting depends upon the extent to which visual and acoustical separations are present. An open space

school is further defined in literature as a school in which instruction occurs in open areas which are able to accommodate the equivalent of three or more traditional classrooms. Open space schooling, therefore, is not synonymous with open education, open programs or open instruction (George, 1975, 3).

There is no coherent body of research supporting or condemning the status of an open education program. Open education in itself is flexible and lacks precision; therefore, general statements about the effects of open programs should be made cautiously, if at all (Katz, 1972; Walbert and Thomas, 1972).

Studies concerning cognitive achievement indicated both significant differences and no significant differences in the traditional and open programs. The following studies indicate the discrepancy and general lack of agreement in this area.

Allen Moodie, using the seventh graders' scores on the Gates-MacGinitie Reading Test, indicated that on initial testing, open school children attained lower scores than children from traditional classes. Assessing the reading skills of speed and accuracy, and vocabulary and comprehension, the study indicated that the mean score of the speed and accuracy scale was significantly lower for open space school students than for traditional school students. Scores on vocabulary and comprehension were not significantly different. However, the same test administered to the same students five months later revealed that the mean score differences in all areas of reading skills diminished to statistically

insignificant levels (Moodie, 1971). Another very similar study by B. C. McRae, utilizing 70 students and conducted in British Columbia, revealed very similar results (McRae, 1970).

Tuckerman and his associates reported that a study involving students from grades one to five resulted in no significant difference when comparing the open and traditional setting (Tuckerman, et. al., 1971). In contrast, however, Jack Sackett, using the Iowa Test of Basic Skills, found that children in open space schools achieved significantly lower than the comparison groups from both a self-contained school and a departmentalized school. Sackett's study comparing the two settings reported that when IQ scores were held constant, students in the open space schools were significantly lower in achievement than students in traditional settings (Sackett, 1971).

Marie Hopke attempted to determine if academic functioning was related to the concept of openness or traditional setting. One hundred forty first, second and third graders were given the Iowa Test of Basic Skills. Analysis of variance using the α 0.05 level indicated that no significant differences were found between first graders; however, second and third grade students from traditional schools scored significantly higher than open concept students on some of the subtests (Hopke, 1974).

Several studies reported contradictory conclusions concerning research results. G. J. Harrington used reading achievement tests and determined there were no significant differences in reading gains between

students in open or traditional classroom settings (Harrington, 1971). J. B. Warner also failed to uncover any significant differences in achievement between open space and traditional schools (Warner, 1970).

In another study comparing open and traditional settings, Brian Burnham controlled the variables of his study using closely matched IQ scores for first graders. The results of the study indicated no significant differences in the achievement test scores (Burnham, 1971).

Another longitudinal study with 270 students conducted over a three-year period resulted in significantly higher scores in achievement by students involved in open program instruction. This significant gain was evidenced during the second year of school and occurred in total reading, total math and vocabulary. The gains evidenced in the second year of school continued through the third year of this study (Killough, 1971).

Peggy Mills conducted a study comparing 270 children in open and traditional classrooms using seven dependent achievement variables. Several areas of academic achievement were evaluated using the Stanford Achievement Test. A one-way analysis of variance indicated that the students in open classrooms and traditional classrooms were not significantly different in academic achievement using the α 0.05 level. Traditional students, however, scored significantly higher than open classroom students on the arithmetic concepts subtest (Mills, 1975).

Ann Lukasevich conducted a study in Canada using 321 third grade students in open and traditional schools. The students were tested on the Canadian Test of Basic Skills and results were analyzed via thirteen

multiple regression stepwise analyses. Based on the evidence in this study, reading achievement was higher when taught using a traditional method regardless of open or traditional setting. However, mathematics concepts were higher when taught using a traditional lecture-oriented approach and a traditional setting (Lukasevich, 1976).

Rachel Grogan studied the academic achievement of seven, eight, and nine-year-olds as assessed by the Iowa Test of Basic Skills. The results of her study were consistent with recent findings. A t-test for significance between two independent means indicated that there was no significant difference between the mean achievement scores of students in the two settings (Grogan, 1976).

Betty Dempsey investigated the effect of classroom openness upon achievement in the basic skills of third graders. The Iowa Test of Basic Skills was utilized in testing academic achievement. An analysis of variance indicated that achievement in reading and mathematics for students in open and traditional settings did not differ significantly at the α 0.05 level (Dempsey, 1975).

A study conducted by Robert Rozar compared the academic achievement of fourth graders in mathematics. Again, the students were compared by open and traditional settings and tested using the Iowa Test of Basic Skills. Rozar reported that at the α 0.05 level there was a significant difference in favor of traditional classrooms in the subskill of mathematics concepts. Overall comparisons, however, showed no clear statistical advantage between open and traditional settings (Rozar, 1976).

Reynolds' study, conducted with 250 students from open and traditional classroom programs, evaluated academic achievement in grades one to six from two elementary schools. Reynolds reported that "Of the forty-four separate subscale analyses which were performed in grades one to six, only 14 resulted in significant differences between the open classroom and traditional groups. Of these 14, 10 were in the direction of the traditional program and 4 favored the open classroom program. However, 7 of the 10 favoring the traditional program were in 4th grade so that, except for this grade, the two programs were essentially equivalent in their effect upon attainment of basic skills." This study reported that "In 4th grade, the decided superiority of the traditional students on the Stanford Achievement Test might be a result of a teacher or testing effect rather than a program effect. Overall, then, more evidence is needed before it is concluded that a significant differential effect upon achievement of basic skills can be attributed to either the traditional program or the open classroom program." (Reynolds, 1974b, 38)

This comparison study did not provide statistical support concerning the superiority of either program as related to achievement. There was evidence, however, to suggest that open programs effected positive gains in affective attitudes toward school (Reynolds, 1975a).

A study by Gloria Russell followed students from grade one to grade five in both open and traditional settings. Student achievement was measured on the Stanford Achievement Test and the Metropolitan Achievement Test. Analysis of covariance was used to compare performance

as related to setting. Russell concluded that student achievement at the open setting school at the end of the first grade was significantly higher. Student performance at the open setting school did not deteriorate through the fifth grade (Russell, 1977).

A slightly different finding was revealed in a research study by James Daniels, who surveyed 120 second, fourth and sixth graders and administered the Stanford Achievement Test. Significant differences were found for certain subtests at certain grade levels but no consistent patterns in either reading or mathematics was indicated. All significant differences found were in favor of open program schools (Daniels, 1974).

Using the terms of introvert and extrovert added additional variables to a study conducted by Sharon Cerami. Cerami surveyed the sixth grade population of a northwestern Pennsylvania school and compared academic achievement in open and traditional classroom organizational patterns. Her study revealed that no significant differences were found in reading or mathematics; however, significant gains in positive attitude toward reading were found in the open classroom (Cerami, 1974).

Dorrit Greene assessed the responsiveness to feedback as measured by success in each classroom setting. This 1979 study coupled motivation and responsiveness with success. The resulting analysis indicated that students from open classrooms were found to be more responsive to feedback than those from traditional settings (Greene, 1979).

Similar results were also reported by Evelyn Haarer and Stanley Wurster in their study of 58 fifth graders. However, their study compared gain scores of students from fourth to fifth grade as measured by the SRA Assessment Survey Achievement Series (Haarer and Wurster, 1974).

SUMMARY OF LITERATURE REVIEW

A review of literature, utilizing a DATRIX and ERIC search, suggested that up to 1979 there was still little conclusive evidence to support increased academic achievement specifically attributed to classroom setting. Frank Brunette concluded "...that available measures of academic achievement are often not sensitive enough to measure whatever differences, if any, exist between open and traditional schools " (Brunette, 1971, 7-11). Thus, there is little to indicate that serious negative effects on achievement can be solely attributed to open or traditional settings.

PROCEDURES OF THE STUDY

Population

The sample of this study consisted of 388 students who were in the third grade in 1977-78 and in the fifth grade in 1979-80 at the same school. All elementary schools in Berkeley County were included in the study. Students were not included in the study if they changed schools between the third and fifth grade testing or if they did not have the CTBS reading and mathematics scores for both grades three and five. Thus, the excluded portion of the population consisted of 358 students who moved within or out of Berkeley County between the third and fifth grade or were absent at the time of third or fifth grade testing.

Since research suggests a positive correlation exists between socioeconomic status (SES) and achievement, SES level should be considered when examining achievement variations. Consequently, each student in the study was assigned to one of two levels of SES. Level I included students not participating in the free or reduced lunch program while Level II included those who met the limited income criterion. Therefore, this study looked at whether or not there were significant differences in achievement among students from the three different settings after controlling for SES.

Table I is a breakdown of the population according to school setting and SES level.

TABLE 1

Distribution of Sample by SES and Setting

SES Level	Setting			
	Open	Traditional	Mixed	Total
Level I (high)	141	25	94	260
Level II (low)	64	29	35	128
Total	205	54	129	388

Instrument

The reading and mathematics achievement instrument was the Comprehensive Test of Basic Skills (CTBS). The composite, or total scores for both reading and math were used in this study to compute gain scores.

In the third grade students were administered Form S, while at the fifth grade level the same students were administered the parallel Form T. All information about individuals in the sample was coded for computer analysis. At no time did student names appear in the data analysis.

Methodology

One type of results yielded by the CTBS is known as expanded standard scores (ESS), which can be used in computing gain scores from kindergarten through high school because they are independent of form, level, and grade. Since expanded scale scores are produced from a single, equal interval scale of scores across all grades, they are conducive for assessing achievement growth at a more specific level than would be true for percentile scores or stanines. For example, an increase of one ESS may hypothetically change a percentile from 49 to 50, while five may be required to change one's percentile from 92 to 93. Such specificity increases the variance, thus enhances the strength of the statistical analysis. Therefore, the ESS scores were used to compute gain scores for each student in the sample. Students were identified and coded as members of Level I or Level II SES group and as participants in an

open, closed, or mixed setting school. Categorizing students according to these two independent variables, type of school setting and SES, produced six groups--a Level I SES and Level II SES from each of the three settings.

Data were analyzed using a 3 (school settings) x 2 (SES levels), two-way analysis of variance.

Limitations to Conclusions and Findings of the Study

Limitations to conclusions and findings of the study were:

1. This study examined achievement as related only to physical, architectural setting and did not address methodology or instructional programs. The cited research studies did not distinguish between open space and open education; consequently, the review of literature must be examined within this parameter.
2. The parameters of this study were limited to the effects of setting and socioeconomic level on achievement. No other factors, for example, the affective domain, were considered.
3. Only students who had reading and mathematics scores from both third and fifth grades were included in the sample. Students who changed schools within or out of Berkeley County between the third and fifth grade were also excluded from this study.

Results of the Study

A 3 x 2 two-way analysis of variance was used to analyze the data obtained for the study. Tables 2 and 3 present the cell mean gain scores and standard deviations for each of the six groups.

Reading

The results of the analysis of variance indicated that (1) the mean gain scores in reading for the three groups were significantly different ($F = 3.236$, $df = 2$, $p = 0.04$); (2) no significant difference between the mean gain scores of Level I and Level II socioeconomic groups was reported; (3) no significant interaction occurred between socioeconomic level and school setting.

TABLE 2
Reading
Mean Gain Scores (M) and Standard Deviations (SD)

SES	Setting					
	Open		Traditional		Mixed	
	M	SD	M	SD	M	SD
Level I (high)	95.87	41.54	91.40	51.72	87.06	44.61
Level II (low)	90.91	43.64	67.07	35.75	79.66	39.93

Mathematics

The results suggested that (1) the mean gain scores for mathematics were not significantly different between students from the two socioeconomic levels; (2) the mean gain scores for mathematics between school settings were not significantly different; and (3) using mathematics mean gain scores, no significant interaction was found between socioeconomic level and school setting.

TABLE 3

Mathematics
Mean Gain Scores (M) and Standard Deviations (SD)

SES	Setting					
	Open		Traditional		Mixed	
	M	SD	M	SD	M	SD
Level I (high)	89.10	49.75	92.88	30.24	96.12	39.14
Level II (low)	74.70	51.61	80.28	31.33	98.11	36.59

CONCLUSIONS

At the α 0.05 significance level, the results of this study showed no significant difference between mean gain scores in mathematics or reading for students from the two SES groups or between mean gain scores for students attending three different types of school settings. The only significant F ratio was found for mean gain scores in reading for the students from the three different school settings--open, traditional and mixed. Neither socioeconomic level nor school setting had a significant effect on mathematics achievement. The interaction between the two independent variables, socioeconomic status and setting, was not significantly related to mathematics and reading gain scores.

In general, the results of the study suggested that the relationships of reading and mathematics gain scores to school setting and socioeconomic status were not significant. Due to the statistical test utilized and the information available, the only significance found could not be solely attributed to any specific school setting. That is, one setting was not more significantly related to reading and mathematic gains than any other setting. These findings were consistent with the available research on the subject.

BIBLIOGRAPHY

- Brunette, Frank. Open Space: A Status Report. Memorandum No. 1. California: Stanford University, School Planning Laboratory, 1971b.
- Burnham, Brian. Achievement of Grade One Pupils in Open Plan Architecturally Conventional Schools. Ontario: 1971.
- Cerami, Sharon L. "A Comparison of Four Factors Related to Reading Instruction Within Two Types of Classroom Organization: Structured and Open." Unpublished Doctoral dissertation, Pennsylvania State University, 1974.
- Daniels, James G. "A Comparison of the Achievement and Attitudes of Students Attending Open Space Schools with Students Attending Traditional Schools." Unpublished Doctoral dissertation, University of Florida, 1974.
- Dempsey, Betty J. "Academic Achievement and Self-Concept of Third Grade Children in Open and Traditional Classrooms." Unpublished Doctoral dissertation, Texas Woman's University, 1975.
- George, Paul. Ten Years of Open Space Schools: A Review of Research. Florida: Florida Educational Research and Development Council, 1975.
- Greene, Dorrit. "Level of Aspiration of Elementary School Children in Open and Traditional Classrooms as Related to Success and Failure Experiences, Type of Task, and Sex." Unpublished Doctoral dissertation, New York University, 1979.
- Grogan, Rachel B. "A Comparative Study of the Openness of the Learning Environment, Student Achievement, and Student Self-Concept as a Learner in an Open Space School and a Non-Open Space School." Unpublished Doctoral dissertation, Georgia State University, College of Education, 1976.
- Haarer, Evelyn A. and Stanley Wurster. "A Comparison of Fifth Grade Achievement in an Open Classroom Between Students Who Were in a Fourth Grade Self-Contained and Students Who Were in Fourth Grade Open Class." Unpublished Doctoral dissertation, 1974.
- Harrington, G. J. "A Study of the Effects of the Neurological Impress Method of Remedial Reading with Selected Fourth and Fifth Grade Students in Open and Enclosed Areas of Instruction." Unpublished Doctoral dissertation, University of Houston, 1971.

- Hopke, Marie E. "A Comparison of Basic Skills' Achievement Level, Attitude Toward School, Academic and Global Self-Concepts of Open Concept Primary Grade School Students and Traditional Self-Contained Classroom Primary Grade School Students." Unpublished Doctoral dissertation, University of Washington, 1974.
- Katz, Lillian. Research on Open Education: Problems and Issues. Urbana, Illinois: Eric Clearinghouse on Early Childhood Education, 1972.
- Killough, Charles K. An Analysis of the Longitudinal Effects That a Nongraded Elementary Program Conducted in an Open Space School had on Cognitive Achievement of Pupils. Houston University, Texas: Bureau of Educational Research and Services, 1971.
- Lukasevich, Ann. "A Study of Relationships Among Instructional Style (Open vs. Non-Open) Architectural Design (Open Space vs. Non-Open Space) and Measures of Self-Concept and Reading and Mathematics Achievement of Third-Grade Children." Unpublished Doctoral dissertation, University of British Columbia, 1976.
- McRae, B. C. The Effects of Open-Area Instruction on Reading Achievement, Research Report 70-23. Vancouver: Board of School Trustees, Department of Research and Special Services, 1970.
- Mills, Peggy. "A Comparative Study of the Self-Concept and Academic Achievement of Eight-Year-Olds in Open and Traditional Classrooms." Unpublished Doctoral dissertation, University of North Carolina at Chapel Hill, 1975.
- Moodie, Allan G. A Survey of Reading Achievement in a Secondary School Population, Research Report 71-03. Vancouver: Board of Trustees, Department of Planning and Evaluation, 1971.
- Rathbone, Charles. "The Open Classroom: Underlying Premises," The Urban Review, (September, 1971), 4-10.
- Reynolds, Robert. "A Two-Year Evaluation of the Comparative Effects of an Open Classroom Instructional Program and a Traditional Instructional Program." Pennsylvania: Pennsylvania Department of Education, 1975.
- Reynolds, Robert. "A Cooperative Evaluation of the Effects of an Open Classroom Instructional Program and A Traditional Instructional Program." Harrisburg: Pennsylvania State Department of Education, 1974.

- Rogers, Vincent R. "English and American Primary Schools," Phi Delta Kappan, LI (October 1969), 71-75.
- Rozar, Robert M. "A Comparative Study of Attitude Toward School, Intellectual Achievement Responsibility, and Achievement in Mathematics of Fourth-Grade Students in Open and Traditional Classroom Instructional Programs in Selected Schools in Dekalb County, Georgia." Unpublished Doctoral dissertation, Georgia State University, College of Education, 1976.
- Russell, Gloria A. "A Longitudinal Comparison of Achievement Differences Between Children in an Open-Access Elementary School and Traditional Classrooms." Unpublished Doctoral dissertation, University of Rochester, 1977.
- Sackett, John W. "A Comparison of Self-Concept and Achievement of Sixth Grade Students in Open Space School, Self-Contained School and Departmentalized School." Unpublished Doctoral dissertation, The University of Iowa, 1971.
- Stetz, Frank I. "Toward Better Assessment of Student Achievement in Informal Educational Settings." Paper presented to the American Educational Research Association Convention, Chicago, Illinois, April, 1974.
- Tuckman, Bruce W., and others. "Evaluating the Open Classroom." Paper presented at the American Educational Research Association Convention, New Orleans, Louisiana, February 25 - March 1, 1972.
- Wälbirt, Herbert J. and Susan C. Thomas. "Open Education: An Operational Definition and Validation in Great Britain and United States." American Educational Research Journal, IX (Spring 1972), 197-208.
- Warner, J. B. "A Comparison of Students' and Teachers' Performances in an Open Area Facility and Self-Contained Classrooms." Unpublished Doctoral dissertation, University of Houston, 1970.
- Wilson, F. S., T. Stuckey, and R. Langevin. "Are Pupils in the Open Plan School Different?" The Journal of Educational Research, LXVI (November 1972), 115-118.